FRBSF WEEKLY LETTER

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Insurance and Managing Bank Risk-Taking

This *Weekly Letter* is part of a series of digests of articles that appear in the Federal Reserve Bank of San Francisco's quarterly *Economic Review*. These digests are intended to make the major findings of research conducted at the San Francisco Reserve Bank available to a wider audience. Readers who wish to obtain individual copies of a Review, or who would like to be placed on the mailing list for the Review, may do so by writing the Public Information Department, P.O. Box 7702, San Francisco, California 94120. The articles summarized here appear in the Spring 1984 issue of the *Economic Review*.

Deposit Insurance Reform

Many observers credit the establishment of federal deposit insurance in the 1930s with preventing the periodic banking panics that had destabilized the U.S. banking system before 1933. Recently, however, we have come to appreciate that the existing system of deposit insurance may actually encourage banks (and other depository institutions) to assume more risk in their loan making and investment activities than is socially desirable. Deposit insurance may reduce depositors' incentives to monitor the financial health of the institutions in which they have invested their funds. Depository institutions themselves may be encouraged to take on more risk than they would otherwise because the potential costs of failure are shared with the insurer.

This concern that the current system of deposit insurance encourages excessive risk taking has led to periodic proposals for reform. Most notable among these proposals is the one calling for institutions to be charged differential insurance fees (rather than the current flat fee) based on the riskiness of their portfolios. Difficulties with implementing such reforms, however, call their practicality into question. Three of the four articles in the Spring 1984 *Economic Review* suggest alternative reforms the FDIC and other insurers can undertake. The fourth describes a method of pricing mortgages borrowed from options pricing models.

Improved solvency control

In "Deregulation and Deposit Insurance Reform" David Pyle lists several ways in which financial deregulation is increasing the scope for risk-taking by banks and other depository institutions. These include new asset and product line activities, such as real estate and insurance; the increased uncertainties of coping with deposit rate competition; and financial innovations such as brokered funds, which allow banks to raise funds nationally and to reduce their reliance on local markets in which they are better known. His analysis suggests that improved monitoring and control of bank activities to prevent insolvency may be more important than differentially pricing risk in protecting the insurance funds.

Pyle emphasizes that the insurer's liability—consisting of the difference between the market value of a bank's assets and its deposits when it is closed—depends both on the riskiness of a bank's assets and on the insurer's insolvency policy. By insolvency policy, he means the ratio of the *market* value of an institution's assets to its deposit liabilities at which the insurer will declare the institution insolvent. To examine the relative importance of bank asset risk and the insolvency ratio, Pyle draws on options pricing theory, reasoning that the insurer in effect has agreed to "buy" the bank's assets (where the price is the total value of insured deposits that must be paid off) when a bank's asset-to-liability ratio falls below the insolvency value.

For representative values of asset rate risk and different levels of audit costs, Pyle's calculations suggest that preventing the insolvency ratio from falling below one (at which net worth becomes negative) may be much more effective in reducing the insurer's liability than measures designed to reduce bank risk. As the author notes, the use of book value net worth standards has allowed some institutions to operate at negative net worth, significantly increasing the cost to the insurer in the event that the institution must be closed. In this context, Pyle's calculations suggest that "improved solvency control is a...more important focal point for deposit insurance reform legislation."

Greater use of enforcement powers

Barbara Bennett, in "Bank Deregulation and Deposit Insurance: Controlling the FDIC's Losses,"

examines the ways in which the FDIC could use its current regulatory and supervisory powers to reduce the risk to the insurance fund caused by excessive risk-taking. Bennett notes that the tendency for bank regulators, including the FDIC, to let an institution's net worth become negative before taking action offers a powerful incentive to banks to take extraordinary risks because, at that point, the costs of failure will be borne entirely by the insurer.

Bennett considers the FDIC's (and other agencies') regulatory powers in such areas as loan concentrations, insider transactions, and capital adequacy standards analogous to restrictive covenants in bond indentures. Their purposes are the same: to restrict risk-taking activities that would reduce the value of the insurance fund and the value of the bondholders' claims on the firm, respectively. Minimum capital standards, for example, limit the extent to which a bank can increase its deposit liabilities (and hence the potential claim on the insurance fund) without also increasing its capital base.

The author argues that despite the substantial powers of enforcement at the FDIC's command, "On the whole, the FDIC has tended to make limited use of its current enforcement powers, particularly those involving legal proceedings, ...tend(ing) to rely (instead) mainly on informal agreements and on more frequent examinations..." Bennett concludes that "the FDIC's apparent reluctance to resort to more serious measures until institutions are on the verge of insolvency unnecessarily increases the risk to the insurance fund."

Terms of maturity

In the third article on deposit insurance, "A View on Deposit Insurance Coverage," Frederick Furlong analyzes the FDIC's recent "modified pay-out policy," which puts large-denomination deposits at risk. Furlong concludes that this policy "could make the banking system more unstable by increasing the probability of 'bank runs'," and that "...it may be more appropriate to base insurance on terms of maturity, with short-run deposits receiving coverage."

Since the inception of Federal Deposit Insurance, insured and uninsured deposits have been segregated on the basis of account size. In practice, however, and with a few exceptions, holders of "uninsured" deposits have not incurred losses from bank failures. The modified payout plan is an attempt to reinstate some market discipline by giving large depositors a greater incentive to monitor bank risk-taking activities. Under the plan, uninsured depositors would receive immediately a pro-rata share of what the FDIC thought it could recover from liquidating a failed bank's assets.

In assessing the FDIC's modified payout policy, Furlong distinguishes two rationales for deposit insurance. The first, protecting the small saver, is based on the presumption that such individuals are at a disadvantage in calculating the riskiness of a depository institution's liabilities. Moreover, such small savers are presumed to be more susceptible to risk exposure because of a limited ability to diversify their portfolios. Furlong argues that the current deposit insurance system does protect the small saver, but does so at some expense to the second objective of deposit insurance, that of ensuring aggregate financial stability. Moreover, he maintains that contemporary financial markets offer ample opportunities for safe investments by the small saver.

Furlong believes that the more defensible objective of deposit insurance is to maintain stable financial markets by forestalling the sort of depositor runs and associated banking panics that severely disrupted financial markets before the establishment of the FDIC. He argues that putting large depositors at risk does not directly address this threat to financial stability because the critical dimension in the problem of bank runs is the term to maturity of deposits. Highly liquid deposits—withdrawable at par on demand or on short notice—enable depositors to withdraw such funds as soon as they become concerned about an institution's financial health. The author argues, therefore, that a distinction be made between insured and uninsured deposits on the basis of terms of maturity, not account size.

An options approach to pricing mortgages

In the final article, "Pricing Mortgages: An Options Approach," Randall J. Pozdena and Ben Iben demonstrate how a numerical options pricing technique can be used to price mortgages with different contract provisions, such as interest rate "caps" on adjustable rate mortgages (ARMs). Their simulation results, among other things, suggest that current techniques for pricing ARMs may

cause them to be "overpriced," that is, lead to original contract rates that are too high relative to what the market is willing to pay.

The application of the options pricing model to mortgages relies on the observation that a mortgage can be thought of as a coupon-type bond with certain options attached to it. A mortgage with a prepayment option, for example, can be thought of as a package consisting of a bond (the mortgage) plus a call provision (the option of the borrower to pay off the "bond," usually at a price equal to the existing balance of the loan plus any prepayment penalty).

The value of an option comes from its effectiveness as a hedge against interest rate risk. The prepayment option on a mortgage, for example, has value because it "insures" the borrower against being locked into a relatively high interest rate should market interest rates fall. Options pricing models use this idea to infer the value of an option from the price of the underlying security and the prevailing rate of interest. The value of a mortgage according to such a model would reflect both the value of the bond component and the value of the attached options(s), if any.

Pozdena and Iben use a numerical options pricing model to simulate contract interest rates on mortgages with different contract provisions. Simulations of yields for both fixed and adjustable rate mortgages resulted in several interesting findings. First, the large spreads between fixed and ARM rates suggest that the insulation from interest rate risk offered a lending institution by ARMs are obtained only at the expense of a substantial reduction in the rate that can be charged on that type of mortgage. Second, the spreads between ARMs with different-sized "caps" on the total increase in the contract interest rate allowable over the life of the mortgage are smaller the lower the level of prevailing short-term market rates of interest. This finding, the authors argue, "suggest(s) that 'mark-up' rules of thumb in pricing variable-rate mortgages...probably should not be employed by mortgage lenders."

Finally, Pozdena and Iben note that the simulations of ARM yields are typically closer to the short-term rate of interest than is, at least on the basis of the casual evidence, observed in the marketplace. The authors speculate that this *may* have meant ARMs were "overpriced" in the market, and that this would help explain why such contracts met widespread market resistance when first introduced.

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BANKING DATA—TWELFTH FEDERAL RESERVE DISTRICT

(Dollar amounts in millions)

Selected Assets and Liabilities Large Commercial Banks	Amount Outstanding 10/3/84	Change from 9/26/84	Change from 12/28/83 Dollar	Change from 12/28/83 Percent Annualized
Loans, Leases and Investments[1] [2]	183,446	608	7,421	5.4
Loans and Leases[1] [6]	164,668	836	9,313	7.7
Commercial and Industrial	49,745	659	3,782	10.6
Real estate	60,882	− 55	1,983	4.3
Loans to Individuals	30,226	127	3,575	17.4
Leases	5,042	− 4	− 21	− 0.5
U.S. Treasury and Agency Securities[2]	11,715	− 92	− 792	− 8.2
Other Securities[2]	7,063	− 135	− 1,100	− 17.5
Total Deposits	192,186	4,380	1,189	0.8
Demand Deposits	46,236	3,008	− 3,001	− 7.9
Demand Deposits Adjusted[3]	29,626	1,122	− 1,705	− 7.0
Other Transaction Balances[4]	12,648	749	− 127	− 1.2
Total Non-Transaction Balances[6]	133,302	623	4,317	4.3
Money Market Deposit Accounts—Total	37,765	242	− 1,832	− 6.0
Time Deposits in Amounts of $100,000 or more	41,142	33	2,977	10.1
Other Liabilities for Borrowed Money[5]	20,324	−2,581	− 2,683	− 15.1

Weekly Averages of Daily Figures	Period ended 9/24/84	Period ended 9/10/84
Reserve Position, All Reporting Banks		
Excess Reserves (+)/Deficiency (−)	105	23
Borrowings	47	39
Net free reserves (+)/Net borrowed(−)	58	− 15

1 Includes loss reserves, unearned income, excludes interbank loans
2 Excludes trading account securities
3 Excludes U.S. government and depository institution deposits and cash items
4 ATS, NOW, Super NOW and savings accounts with telephone transfers
5 Includes borrowing via FRB, TT&L notes, Fed Funds, RPs and other sources
6 Includes items not shown separately